February 2022

GUIDELINE

Welcome to the BRANZ monthly technical update

Construction and COVID-19

Traffic light system in place

New Zealand is operating under the 'traffic lights' COVID-19 Protection Framework. You can find out what this means for building work and building sites on the CHASNZ website.

If you have a workmate who is finding it tough to cope with everything that is happening, help is available through the MATES in Construction website or phone 0800 111 315.

The lowdown on low-E glass

We'll be seeing a lot more of it in our double glazing

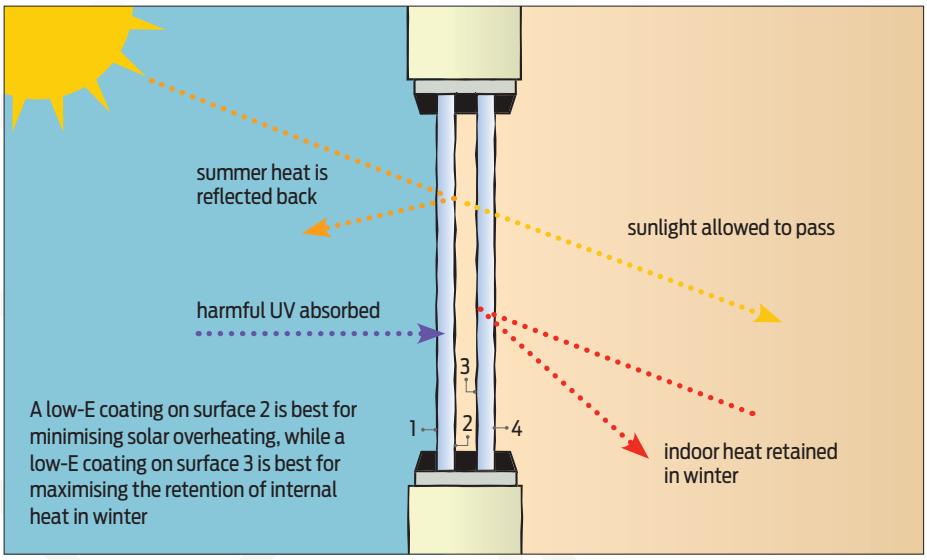


Figure 1. Schematic illustration of the effects of low-E glass.

Low-E (low-emissivity) glass has a microscopically thin transparent coating that allows light through in both directions but reflects infrared radiation (and associated heat) back (Figure 1), allowing glazing to keep a house warmer in winter or cooler in summer. (The impact of low-E glazing in both summer and winter needs to be considered - a slight compromise at one time of year may be necessary to achieve an overall better energy performance outcome.)

Low-E glass has been available in New Zealand for many years but so far has not been routinely specified in glazing systems for all new houses. This will change in November this year when the new Acceptable Solution and Verification Method for Building Code clause H1 *Energy efficiency* come into force. The tables in Appendix E of H1/AS1 and H1/VM1 5th edition provide guidance on the windows/glazing that will comply with the new insulation requirements. There is a lot of low-E glass in the double and triple-glazed windows in the tables, where it is referred to as Low-E1 to Low-E4. These descriptions (developed for the purpose of this table) indicate different thermal performance levels of low-E coatings, from basic to very high. Note that the new requirements are only relevant to the insulation value (R-value) and do not yet cover light or solar gain.

Low-E technology has vastly improved in recent years - some new products give 10 times the thermal performance of older ones and can selectively block certain wavelengths (colours) while allowing others to pass through. Double glazing with the newest low-E coatings can perform about as well as some entry-level triple glazing but without the additional weight and bulk of triple-glazed windows. Window manufacturers and glass suppliers can provide more details.

In this issue:

Floor insulation under H1/AS1 5th edition

More guidance is coming

The changes to H1/AS1 include higher thermal performance requirements for floors and changes to the way the thermal resistance and construction R-value of floors are calculated. The new rules introduce different minimum requirements (using the schedule method) for slab-on-ground and other floors. Heated floors have their own minimums.

- For slab-on-ground floors, a minimum construction R-value of R1.5 is required in the new climate zones 1-4, R1.6 in zone 5 and R1.7 in zone 6.
- Other floors require a minimum R2.5 in the new zones 1-3, R2.8 in zone 4 and R3.0 in zones 5 and 6.
- For all heated floors, the minimum is R2.5 in the new zones 1-3, R2.8 in zone 4 and R3.0 in zones 5 and 6.

Appendix F in the new H1/AS1 and H1/VM1 gives an acceptable method for determining the construction R-values of slab-on-ground floors, with extensive tables in H1/AS1 showing construction R-values for selected slab-on-ground floor scenarios.

One of the previous methods of calculating floor R-values, NZS 4214:2006 *Methods of determining the total thermal resistance of parts of buildings*, will no longer be able to be used. The 5th edition and earlier of the BRANZ *House insulation guide* uses the new method, although the nominal soil conductivity and internal surface heat transfer coefficient have changed in the new H1/AS1. BRANZ will publish an updated 6th edition of the *House insulation guide* this year to take account of this, and the results will change slightly.

For more details, see H1/AS1 5th edition.

Gas supply changes planned

Higher costs for consumers

The Commerce Commission has proposed making changes to the gas supply networks that involve higher costs for consumers over the next 4 years. (This does not include the impact of changes in other areas, such as the wholesale price of gas.) You can find the Commission's draft decision here. Submissions are due by 10 March 2022.

Timber moisture meters

Crucial tools, but use them properly

From time to time, we hear of people coming unstuck because they haven't used a moisture meter properly or are using the incorrect type for the job. Here's a quick refresher on testing the moisture content in timber.

Non-invasive meters don't leave a mark on the timber and are commonly used on finished timber and in services such as prepurchase house inspections. Older style capacitance meters lose both signal and strength rapidly with timber depth, while microwave-type units can penetrate to greater depths. Non-invasive meters only give an indicative or comparative measurement of moisture. They don't give you an actual percentage moisture content for timber. Results can be directly affected by very knotty timber, and they may give misleading results if there are nails or bolts or metal strapping present. Do not rely on them for jobs where knowing the actual moisture level in timber is crucial.

Invasive (resistance) meters with pins or probes that go into the surface of timber give more-accurate results and are the only type that show the percentage of moisture

content in timber. Some have insulated prongs of up to 30 mm depth that are driven in by a sliding hammer. Even with these meters, it is not just a matter of inserting the probes and reading the numbers - you need to consider the timber species, preservative treatment and even the wood temperature in some cases. There may be correction factors that need to be applied in order to ensure results are accurate. For best results:

- ensure the meter is calibrated and the long probes have undamaged insulation
- make two marks on the timber surface with the points of the probes
- drill two holes to the same depth using a depth-limiting device so the points of both probes will be in good contact
- insert the probes and use the sliding hammer just enough to bed the uninsulated probe tips in the timber
- read the results and apply any amendments or correction factors necessary for the timber species, preservative used and temperature or other variables noted by the moisture meter manufacturer.

As always, read and follow the meter manufacturer's instructions.

Concrete on the coast

Strength, cover and quality are important

If you are using exposed metal fixings and fixtures in coastal locations, you will be well aware of the need to select ones that can handle the corrosive environment, but there are specific requirements for exterior concrete near the coast as well. Concrete strength, cover and quality must all ensure that carbonation or chloride never reaches the reinforcing steel.

- **Concrete strength:** While the minimum 28-day strength in megapascals (MPa) for reinforced concrete is 17.5 MPa in exposure zone B and 20 MPa in exposure zone C, it must be 25 MPa in exposure zone D, near the sea.
- **Concrete cover:** The minimum concrete cover to steel reinforcement doesn't change by exposure zone. It is 75 mm for concrete placed directly on or against the ground, 50 mm in all other situations where the concrete is placed in formwork, 30 mm from the top of a wall or floor slab that is in a closed area or 50 mm from the top of any exposed wall or floor slab.
- **Concrete masonry:** Minimum cover to steel reinforcement from an uncoated masonry external face and minimum grout strength does change by exposure zone. It is 45 mm for exposure zone B, 50 mm for exposure zone C and 60 mm for exposure zone D. The minimum 28-day strength for grout fill to concrete masonry is 17.5 MPa in exposure zone B and 20 MPa in zone C, and it must be 25 MPa in exposure zone D, near the sea.
- **Quality:** Ensure that concrete exposed to a coastal environment is dense and well compacted using a poker-head vibrator. Poorly vibrated concrete can allow water and salts to reach the steel, resulting in corrosion and spalling. Using concrete with a finer grade of cement may also help reduce corrosion risk.

See BRANZ Bulletin 574 *Preventing corrosion of reinforcing steel in concrete* and NZS 3604:2011 *Timber-framed buildings* section 4.5 for more details.

Staircase flight limits

How narrow, steep and high can you go?

The December 2021 law change supporting greater housing intensity in our cities makes it easier to build homes up to 3 storeys on small sites. This continues a trend toward multi-storey homes, especially in cities. In Manukau, Waitakere and Wellington, more 2-storey houses are being built than 1-storey homes.

If you are building 2 or 3 storeys on a small site and you want to save space, what are the rules around minimum width and maximum pitch (Figure 2) for internal stairs, and how high can a staircase can go without a landing?

These are the rules from D1 and D1/AS1 for stairs in private dwellings:

- **Stair width:** D1/AS1 does not set a minimum width for stairs in dwellings but recommends a practical minimum width of 850 mm. This is based on Acceptable Solution C/AS2 to clause C *Protection from fire* paragraph 3.3.2 for risk group SM (multi-unit dwellings). D1/AS1 allows spiral stairways with a width less than 1.0 m in dwellings.
- **Pitch:** The maximum pitch for the main private staircase in a home is 37°, but a minor private stairway providing infrequent access to a single space such as a bedroom can go to 47°.
- **Maximum rise between landings:** 4.0 metres.

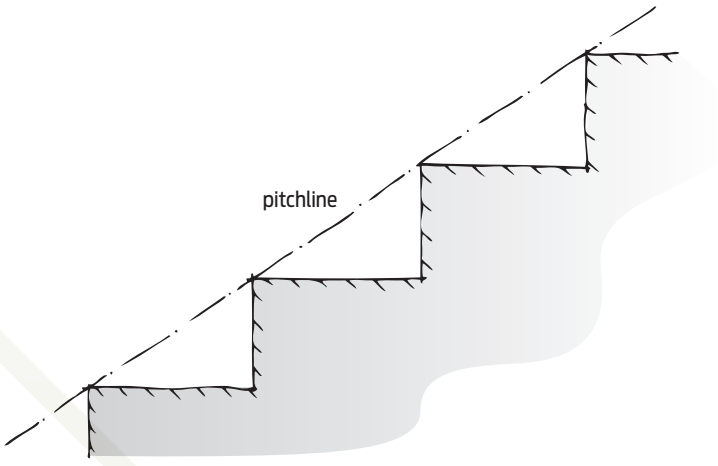
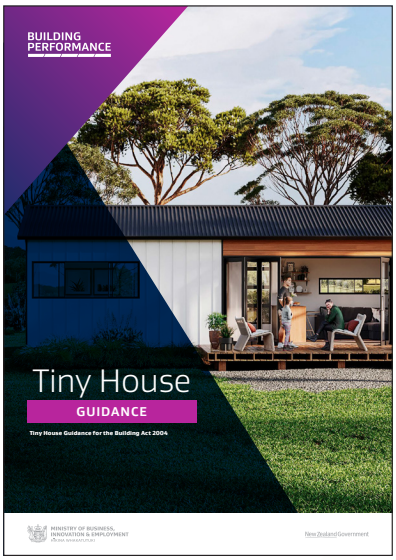


Figure 2. Pitchline of a staircase.

House or vehicle?

The definition of a building



There have been some useful documents published recently to help in the ongoing 'house or vehicle?' debate. MBIE released a new guidance document around tiny houses, and Determination 2021/022 sets out the approach that courts have taken when they have considered the matter.

Here are a few points from Determination 2021/022, mainly based on court findings:

- If a unit comes within the Land Transport Act 1998 definitions, it must be considered a vehicle or motor vehicle for the purposes of the Building Act.
- Registration as a trailer/caravan under land transport legislation does not by itself determine that a structure is a vehicle.
- Whether something is 'immovable' (which brings it under the Building Act) is a matter of degree and will require consideration of things such as design, functional characteristics and purpose. Each case will turn on its own facts.
- Parliament has used the word 'immovable' to refer to something that cannot readily be moved - not something that cannot be moved at all.
- To be defined as a building, a structure does not necessarily have to be fixed to the ground.

Update on leaky/shaky support packages

High uptake in one, zero in the other

Friday 31 December 2021 was the last day applications could be received for a claim under the Weathertight Homes Resolution Services Act 2006. As of that date, MBIE had received 7,385 claims covering 12,828 properties. (Applications covering multi-unit properties were accepted as single claims.) Of the claims received, 4,704 (64%) were closed, 2,312 (31%) were resolved and 369 (5%) were still open at the end of the year.

The Residential Earthquake-Prone Building Financial Assistance Scheme, launched in September 2020, had received zero applications by early January this year. The scheme offers owner-occupiers of apartments in earthquake-prone buildings low-interest loans of up to $250,000 to earthquake strengthen their homes. MBIE is reviewing the scheme.

News

Almost 49,000 new home consents in 2021

Stats NZ figures show that a record 48,899 new homes were consented in the year ended December 2021, up 24% from 2020. Prices for construction of new dwellings also increased by 16% in the December 2021 quarter versus the December 2020 quarter.

15,400 more jobs in construction

The construction industry had one of the largest increases in filled jobs in December 2021 compared with December 2020. Stats NZ figures show a jump of 8.3% - an increase of 15,430 jobs.

Chimneys remain a common hazard

EQC says hazardous chimneys are still common on houses across the country. Pre-1970 brick and concrete masonry chimneys pose the greatest risk as they are less likely to have extra internal reinforcement and are more likely to have deterioration of the mortar holding them together.

Double-digit jump in costs

The New Zealand Infrastructure Commission has reported that the cost of both residential and non-residential construction rose more than 10% in 2021 - the greatest increase since before the global financial crisis more than a decade ago - and similar increases are expected for 2022. It says New Zealand residential construction price inflation averaged 5.2% per annum over 2016 to 2021 - the seventh-highest construction price inflation in the OECD.

TAUMATA AROWAI

Water consultations galore

The national water services regulator Taumata Arowai is consulting on a series of documents including the Drinking Water Standards and Acceptable Solutions for Roof Water Supplies and for Spring and Bore Water Supplies. The Acceptable Solutions (for compliance with the Water Services Act 2021) apply where a small number of households are involved, not to supply for a single household. Submissions are open until 28 March 2022.

The Ministry for the Environment is considering changes to the National Environmental Standards for Sources of Human Drinking Water. Submissions are open until 6 March 2022.

Have you used the BRANZ multi-storey light timber-framed engineering guide?

We want to talk to you if you have used the BRANZ publication *Multi-storey light timber-framed buildings in New Zealand: Engineering design*. This provides guidance on designing light timber-framed (LTF) buildings outside the scope of NZS 3604:2011 *Timber-framed buildings*.

Please help us understand the impact and usefulness of this document and how BRANZ can help you do your work more effectively and efficiently. If you are willing to have a chat, please contact David Carradine at david.carradine@branz.co.nz or (04) 238 1394.

Auckland multi-unit home consents triple in 5 years

In the year ended November 2021, there were 13,639 multi-unit homes consented in the Auckland region - more than triple the number just 5 years previously. Stand-alone house consents outnumbered multi-unit home consents 5 years ago (5,694 versus 4,539), but now Auckland multi-unit consents outnumber stand-alone house consents almost 2:1 (13,639 versus 6,745). In the year ended November 2021, 22,864 multi-unit homes were consented nationwide. In the month of November 2021, there were 4,688 new homes of all types consented nationwide - the highest number for any month on record.

New Zealand house prices out of step internationally

An OECD report says that real house prices in New Zealand have increased much more than in most other OECD countries since the turn of the century. House prices have also increased more relative to household income and rents than in most other OECD countries. Housing affordability is low compared to other countries.

BRANZ Bulletin 668 map update

BRANZ Bulletin BU668 *Complying with H1 - Housing and buildings up to 300 m²* included a map of the six new climate zones in H1/AS1 and H1/VM1 5th edition. Unfortunately, the map published in the bulletin did not include two amendments made during the consultation process under which Rangitikei and Waitaki Districts were split into two climate zones to reflect alpine/coastal differences. You can find the final map in Appendix C of H1/AS1 5th edition.

Waste minimisation funding success

Construction companies received over $100,000 in successful applications to Auckland Council's Waste Minimisation and Innovation Fund. They include Fletcher Residential (Fletcher Living) and Naylor Love for proposals looking at on-site separation of construction waste, Marley NZ for looking at recycling uPVC and HDPE plastic building waste and Expol for increasing its polystyrene recycling capacity.

Winstone Wallboards changes allocation process

Winstone Wallboards announced on 9 February that "effective immediately we will not be accepting or processing new GIB® plasterboard orders for July 2022 deliveries onwards. Over March and April, we will provide specific information to merchant customers on allocations going forward and specifically how the process will work."

Carbon Challenge Webinar Series

Join us for the BRANZ Carbon Challenge webinar series and gain practical guidance on reducing carbon emissions and meeting the carbon challenge for new residential buildings.

- **Wednesday 9 March:** Carbon and the New Zealand building industry
- **Wednesday 16 March:** Compliance and calculating building carbon footprints
- **Wednesday 23 March:** Carbon challenges
- **Wednesday 30 March:** Design and build a low-carbon building

Register now

* Suitable for architects, designers, builders, building consent officers and other building practitioners.

Looking ahead

- April 2022 - MBIE due to release for comment the proposed Building Code compliance changes for 2022.
- April 2022 - changes to the healthy homes standards for rental homes around heating, ventilation and moisture ingress and drainage are expected to come into force.
- 1 July 2022 - in high-risk areas such as Wellington, earthquake-prone buildings (other than priority buildings) must be assessed.
- 1 July 2022 - in medium-risk areas such as Hamilton or Nelson, earthquake-prone buildings in the priority category must be assessed.
- August 2022 - New Zealand's National Adaptation Plan (for climate change) is due to be published.
- 2 November 2022 - end of the 1-year transition period for Building Code compliance changes announced 29 November 2021.
- December 2022 - the Commerce Commission is due to present its final report on residential building supplies.